

Family Pteraclidae

Body ovate elliptical, elongated, greatly compressed. Head moderate or large, compressed, not greatly elevated, upper profile rounded, not partly vertical. Snout short. Eye large, prominent, center usually little in advance of middle of head. Mouth large. Maxillary extends below eye. Teeth small, uniform, in jaws, on palate and tongue. Nostrils usually well separated. Interorbital elevated. Gill rakers few, lanceolate. Scales moderate or rather large, firm, hard, more or less lobate. Row of enlarged basal scales along dorsal and anal. Ventral

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with axillary scale. Dorsal and anal fins very greatly extended, continuous, all rays simple, none articulated or branched, very slender, close set, nearly hair like. Anal begins far forward, before pectoral.

Ventral jugular, inserted before pectoral or about under eye, with spine and 3 to 5 rays.

Fishes mostly of small size, and known from few specimens which mostly immature. They are remarkable for the greatly elevated dorsal and anal. All are pelagic.

Analysis of Genera

a.¹ Dorsal begins on snout before eye, with 2 to 8 graduated anterior spines. Pteraclis.

a.² Dorsal begins on head above hind eye edge or behind eye, with 9 to 13 graduated anterior spines. Pterycombus.

Genus Pteraclis Gronow

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Pteraclis Gronow, Act. Helvetica, vol. 7,
p. 44, 1772. (Species nonbinomial. Type
Coryphaena velifera Pallas, designated
by Jordan and Gilbert, Bull. U.S.

Pteroclis Agassiz, homench. Zool.,
Index Univ., p. 314, 1846. (Type
Coryphaena velifera Pallas.)
(Emendation.)

↓
→ Pteridium Scopoli, Introd. Hist.
nat., p. 454, 1777. (Type Coryphaena
velifera Pallas, monotypic.)

Oligopodus Lacépède, Hist. nat.
Poiss., vol. 2, pp. 511, 518, 1800. (Type
Coryphaena velifera Pallas, monotypic.)
(Oligopodes Cuvier 1817 not involved.)
Pteraclidius R. P. ...

Pteroclideus Agassiz, homench.
Zool., Index Univ., p. 314, 1846.
(Type Coryphaena velifera
↓ Pallas.) (Emendation.)

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p. 44, 1772. (Species nonbinomial. Type
Coryphaena velifera Pallas, designated
by Jordan and Gilbert, Bull. U.S.
Nat. Mus., no. 16, p. 455, 1882.)

teracles Swainson, Nat. Hist.
trils animals, vol. 2, p. 257, 1839. (Type
line. Pteraclis ocellatus Valenciennes,
serrationotypic.) (Error.)

→ Pteridium Scopoli, Introd. Hist.
Nat., p. 454, 1777. (Type Coryphaena
velifera Pallas, monotypic.)

Oligopodus Lacépède, Hist. Nat.
Pois., vol. 2, pp. 511, 518, 1800. (Type
Coryphaena velifera Pallas, monotypic.)
(Oligopodes Cuvier 1817 not involved.)

Pteraclidus Rafinesque, Analyse de
la nature, p. 82, 1815. (Type
Coryphaena velifera Pallas, virtually,
Pteraclidus Rafinesque proposed
to replace Pteraclis Gronow.)

Teeth in jaws slender, villiform
on palate or tongue. Nostrils
double. Opercle without spine. Pteraclis
usually entire, sometimes serrated not typic
4.11.

1871, 1872.
Coryphaena
by Jordan
et. Mus., h

teracles
animals,
Pteraclis
not typic
→ Pteridium

Nat., p. 454,
velifera Pall

Oligopodus

Poiss., vol. 2,

Coryphaena

Oligopodes Cuv

Pteraclidius

supplemental bone, not slip
below very narrow preorbital,
surface silvery like rest of head
slit between base of mandible
preorbital to permit its loss.

a nature, p.

Coryphaena

Pteraclidius

replace Pter

Bentenia Jordan and Snyder,
Journ. College Sci. Univ. Tokyo,
vol. 15, p. 306, 1901. (Type
Bentenia aesticola Jordan and
Snyder, monotypic.)

emphasized as several blackish blotches opposite first and second dorsals and front of caudal peduncle. Iris yellowish to brown. Barbels sulphur yellow. Fins all pale brownish with several obscure darker bands on front of spinous dorsal and soft dorsal, as 5 obliquely over upper caudal lobe and as many over lower, though latter only on inner or posterior half of lobe. Other fins uniformly whitish.

East Indies, Philippines. Closely related to Upeneus tragula, though with paler lower fins and different coloration.

Body oblong, greatly compressed, deep anteriorly, tapering regularly and slenderly behind. Head large, compressed. Snout short. Eye large. Mouth nearly vertical. Maxillary broad. Teeth small, slender, in 1 or 2 series in jaws, often absent from palate and tongue. Gill rakers few. Pseudobranchiae present. Air bladder small. Abdominal cavity extends well behind vent. Pyloric appendages 6. Scales rather large, firm, each with median horizontal furrow or emargination, these forming distinct striated lines along rows of scales. Sheath of very large scales along entire bases of dorsal and anal fins. Long axillary ventral scale.

Scales on head and breast small. Dorsal fin begins on snout, with 2 to 8 graduated spines, one thickened or not; long rays like those of anal, nearly reaching caudal.

Analysis of Species

- a.¹ Dorsal spines 41 to 46, anal 35 to 42.
- b.¹ Dorsal spines 41, anal 35; dorsal and anal deep violet blue with short gold and green iridescent stripes between rays. papilio.
- b.² Dorsal spines 45 or 46, anal 42; dorsal with blue apical blotch size of eye. ocellatus.
- a.² Dorsal spines 50 to 55, anal 40 to 50.
- c.¹ Dorsal spines 50, anal 44; fins without markings. trichipterus.
- c.² Dorsal spines 52, anal 44; fins uniform. carolinus.
- c.³ Dorsal spines 55.
- d.¹ Anal spines 50; vertical fins brown, with white spots. velifer.
- d.² Anal spines 40; vertical fins blackish. cesticola.

Pteraclis papilio Lowe

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- Pteraclis papilio Lowe, Proc.
Zool. Soc. London, vol. 11, p. 83,
1843 (type locality, Madeira). —
Günther, Cat. Fish. Brit. Mus.,
vol. 2, p. 410, 1860 (Madeira). —
[Goode and Bean, Oceanic Ichth.,
p. 212, 1895 (reference).
— Lütken, Kon. Danske Vidensk.
Selsk. Skrift. Kjöbenhavn, vol.
12, no. 6, p. 502, 1880 (reference).]

$\frac{1}{m}$ Guichenot, Notes Ile Réunion, vol.
 2, 1862, p. 24. $\frac{1}{m}$ Jouan, Mém. Soc.
 Imp. Sci. Nat. Cherbourg, série 2,
 vol. 3, 1868, p. 253 (Hong Kong); série
 2, vol. 5, 1870, p. 106 (Seychelles). $\frac{1}{m}$
Bleeker, Verhandl. Kon. Akad. Wetensch.
 Amsterdam, vol. 15, no. 3, 1875, p. 6 (Java,
 Bawean, Bali, Madura, Sumatra, Nias,
 Singapore, Celebes, Sangir, Sumbawa,
 Timor, Halmaheira, Batjan, Oboi Major,
 Amboina, Saparua, Philippines); Atlas
 Ichth. Ind. Néerland., vol. 9, 1877, pl. (2)
 392, fig. 3. $\frac{1}{m}$ Klunzinger, Fische Roth.
 Meer., 1884, p. 49. $\frac{1}{m}$
 Madagascar, Poiss., 1891, p. 219 (not pl.
 27, fig. 2) (Red Sea, Mauritius,
 Pondicherry, Batjan, Celebes, Amboina,
 Borabora, New Guinea, Tahiti).
Steindachner, Sitz. Ber. Akad. Wiss.
 Wien, math.-naturwiss. Klasse, vol. 115,

Depth somewhat less than 4.

D. XXVI, VI; A. XXXV; ventral 6.

Fourth dorsal spine and second anal spine stronger than others. Head and body silvery white. First dorsal and anal deep violet blue, with short gold and green iridescent stripes between rays. (Günther.)

Eastern Atlantic.

Pteracles ocellatus Valenciennes

Pteracles ocellatus Valenciennes,
Hist. nat. Poiss., vol. 9, p. 363, ~~1832~~
~~pl. 271~~, 1833 (type locality,
Mozambique); Règne animal,
Cuvier, ed. ill., Poiss., pl. 66, fig.
2, 1839. — Günther, Cat. Fish.
Brit. Mus., vol. 2, p. 411, 1860
(reference). — Goode and Bean,
Oceanic Ichth., p. 212, 1895 (reference).

— Guichenot, notes Ile Reunion, vol. 2,
p. 26, 1862. — Sauvage, Hist. nat. Madagascar,
Poiss., p. 518, 1891 (reference).

— Jordan, Ann. Carnegie Mus.,
vol. 12, p. 332, pl. 58 (copied), 1919.

— Barnard, Ann. South African
Mus., vol. 21, pt. 2, p. 597, Oct. 1927
(copied).

Cuv⁷⁹ Upeneus vittatus (Forskål)

Mullus vittatus Forskål, Descript.
Animal., 1775, pp. ^{5c.}~~X~~, 31. Ojedda, Red
Sea. + Bonnaterre, Tabl. Ichth., 1788,
p. 144 (Red Sea). + Gmelin, Syst. Nat.
Lin., vol. 1, 1789, p. 1341 (Red Sea). +
Schneider, Syst. Ichth. Bloch, 1801, p.
79 (Red Sea). + Lacépède, Hist. Nat. Poiss.,
vol. 3, 1802, pp. 382, 401, pl. 14, fig. 1
(Arabia). + Shaw, General Zoology,
vol. 4, ¹⁸⁰³, p. 616, pl. 89. - Playfair, Fishes of
Zanzibar, 1866, p. 40 (Aden, Zanzibar, Mayotta).
Upeneus vittatus Cuvier, Hist. Nat. Poiss.,
vol. 3, 1829, p. 448 (Pondichery, Society and
Sunda Islands, Nukuhiva, Japan). +
Rüppell, Neue Wirbelth. Fische, 1835, p. 101
(near Ojedda). + Thiollière, Fauna
Woodlark, 1857, p. 152 (Woodlark Island).
+ Jouan, Mém. Imp. Soc. Sci. Nat.
Cherbourg, vol. 8, 1861, p. 295 (Canal and
Port de France, New-Caledonia). +

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Pterachis ocellatus Valenciennes,
Hist. nat. Poiss., vol. 9, pl. 271, 1833.
(Error.)

Pteracles ocellatus Swainson, Nat.
Hist. Animals, vol. 2, p. 258, 1839
(reference).

12825. Cavite and San Roque markets.
June 27, 1908. Length 75 mm.

12830. Cavite and San Roque markets.
June 27, 1908. Length 101 mm. Type,
No. 68402 U. S. N. M.

5972. Cavite market. December 1, 1908.
Length 82 mm.

20556 and 20557. Subig market,
Tilig. July 14, 1908. Length 67 to 71 mm.
1 example. Subig Bay. January 7, 1908.
Length 58 mm.

Depth 3; head $3\frac{1}{2}$. Snout $5\frac{7}{8}$
 in head from snout tip; eye $3\frac{1}{2}$,
 much greater than snout;
 maxillary reaches $\frac{3}{4}$ in eye,
 expansion 2 in eye, length $2\frac{1}{4}$
 in head from snout tip;
 supraorbital height nearly equals
 vertical eye diameter.

Scales 50 to 52 in lateral
 series, 17 transversely. Lateral
 line axial.

D. XLV or XLVI, begins over
 middle of snout, first spine
 nearly long as eye, second $1\frac{1}{2}$ in
 head, third $1\frac{3}{4}$ in fish without
 caudal; A. XLII, first spine
 nearly equals combined snout and
 eye with base little before hind
 preopercle edge, fourth spine
 $1\frac{2}{5}$ in fish without caudal; least
 depth of caudal peduncle $5\frac{1}{3}$ in
 total head; caudal $1\frac{9}{10}$; pectoral

$1\frac{1}{8}$, rays 15; ventral rays 4,
fin $1\frac{2}{3}$ in total head.

Body silvery, dorsal and
anal blue-gray. Near apex of
dorsal spot or ocellus of clear
blue about size of eye. Dorsal
and anal fins blue gray. Caudal
and pectoral yellowish. Length
59 mm. (Valenciennes.)

Mozambique Channel.

Pteraclis trichipterus Valenciennes (732)
? Pteraclis trich¹ipterus Valenciennes,
Hist. nat. Poiss., vol. 9, p. 367, 1833
(no type locality). — Griffith,
Animal Kingd. Cuvier, vol. 10, p.
, pl. 32, fig. 2, 1834.

Pteraclis trichipterus Guichenot,
Notes Ile Reunion, vol. 2, p. 26, 1862;
Mém. Soc. Sci. nat. Cherbourg,
ser. 2, vol. 2, p. 146, 1866 (Madagascar).
— Lütken, Kon. Danske Vidensk.
Selsk. Skrift. Kjöbenhavn, vol. 12,
no. 6, p. 502, 1880 (reference).

Pteraclis trichopterus Sauvage, Hist.
nat. Madagascar, Poiss., p. 518,
1891 (~~error~~) (reference).

Mullus bandi Shaw, General Zoology,
vol. 4, pt. 2, 1803, p. 615 (on Bandi
goolivinda Russell, Fishes of Cromandel,
vol. 2, 1803, p. 43, pl. 158, Vizagapatam).

Upeneus bitaeniatus Bennett, Proc.
Comm. Zool. Soc., London, May 1831, p.
59. Mauritius.

Lota kummunikar (Montrouzier)
Thiollière, Fauna Woodlark, 1857, p. 152
(name in synonymy).

Upeneoides philippinus Fowler, Proc.
Acad. Nat. Sci. Philadelphia, 1918, p. 37,
fig. 15. Philippines; 1927, p. 285 (Orion;
types).

Depth $3\frac{3}{5}$; head 4. Snout 6 in head from snout tip; eye $2\frac{1}{2}$, greatly exceeds snout, also greater than supraorbital depth; maxillary reaches $\frac{2}{5}$ in eye, nearly vertical, length $1\frac{2}{3}$ in head from snout tip.

Scales small on body, also cover most of head. Lateral line axial, complete.

D. ~~50~~⁴¹, fin begins over front eye edge with first 3 spines graduated to third which $1\frac{1}{2}$ in head, fin height equals fish without caudal; A. ~~XLIV~~^{XLIV}, fin height $1\frac{2}{3}$; other fins subequal with head.

Body silvery, less brilliant on fins. Length 88 mm.
(Valenciennes.)

Madagascar.

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Pteraclis carolinus Valenciennes

- Pteraclis carolinus Valenciennes,
Hist. nat. Poiss., vol. 9, p. 368, 1833
(type locality, Carolina, Collection Bosc).
— Günther, Cat. Fish. Brit. Mus.,
vol. 2, ~~1860~~ p. 411, 1860
(compiled) : — Jordan and Gilbert,
Bull. U. S. Nat. Mus., no. 16, p. 455,
1882 (copied). — Goode and Bean,
Oceanic Ichth., p. 212, ~~pl. 11, fig. 2118~~
~~2118~~ 1895 (not figure; reference).
— Jordan and Evermann, Bull. U. S.
Nat. Mus., no. 47, pt. 1, p. 956, 1896
(compiled).
— Lütken, Kon. Danske Vidensk. Selsk.
Skrift. Kjöbenhavn, vol. 12, no. 6, p.
502, 1880 (reference).

Mus., vol. 71, 1927, p. 7 (Benkoelen, Sumatra). $\frac{1}{m}$ Fowler, Journ. Bombay Nat. Hist. Soc., vol. 32, no. 2, Oct. 20, 1927, p. 259 (Bombay); Mem. Bishop Mus., vol. 10, 1928, p. 226 (Tahiti; Nukuhiva, Suva, Apia, Strong Island, Ebon Island, Society Islands). $\frac{1}{n}$ Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong), p. 647 (Tahiti; types of Upeneoides philippinus).

Upeneoides vittatus Klunzinger, Verhand. zool. botan. Gesellsch. Wien, vol. 20, 1870, p. 741 (Red Sea). (Error) $\frac{1}{m}$ Molpa, Ceylon Administrat. Rep., 1921, pp. E5, E6.

Herre and Montalban, Philippine Journ. Sci., vol. 36, no. 1, May 1928, p. 105, pl. 4, fig. 1 (Aparri, Bangui, ^{La Union,} ~~Marikina~~, ~~Alaminos~~, Iba, Brani, Pasay, Manila, Masugbu, ^{Mindoro,} ~~Marikina~~, ~~Marikina~~, Borongan, ~~Marikina~~, Capiiz, Bantayan, Iloilo, Cebu, Bohol, Dumaguete, Agusan River, Cagayan de Misamis, Balabac, Abao, Zamboanga, Cotabato; Sandakan; Guam). $\frac{1}{m}$

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Mouth very cleft. Scales rather large. D. LII, fourth ray somewhat enlarged, other rays slender, those of caudal larger. A. XLIV. Pyloric appendages 6. Uniform silvery, with bluish reflections. Length 100 mm.
(Valenciennes.)

South Carolina.

Pteraclis velifer (Pallas)

Coryphaena velifera Pallas, Spicilegium,
vol. 8, p. 19, pl. 3, fig. 1, 1770 (type
locality, "Oceano utriusque Indiae,
praesertim Orientalis). — Bonnaterre,
Tabl. Ichth., p. 60, pl. 34, fig. 128,
1788 (sea of the Indies). — Gmelin,
Syst. Nat. Linnaeus, pt. 1, p. 1193,
1789 (copied). — Walbaum, Artedi
Pisc., vol. 3, p. 103, 1792 (copied).
— Forster, Fauna Indica, p. 14,
1795.

~~Velifer~~

Pteridium veliferum Walbaum,
Artedi Pisc., vol. 3, p. 677, 1792 (on
Scopoli).

Pteraclis velifera Schneider, Syst.
Ichth. Bloch, p. 143, pl. 35, 1801 ("in
India orientali").

pt. 1, 1906, p. 1385 (Upolu). $\frac{1}{m}$ Seale,
 Occas. Papers Bishop Mus., vol. 4, no. 1,
 1906, p. 51 (Tahiti; Rukuhiva). $\frac{1}{m}$

Jordan and Seale, Bull. Bur. Fisher.,
 vol. 25, 1905 (1906), p. 273 (Samoa). $\frac{1}{m}$

Smith and Seale, Proc. Biol. Soc.

Washington, vol. 19, June 4, 1906, p. 78
 (Cotabato, Mindanao). $\frac{1}{m}$ Seale and

Bean, Proc. U. S. Nat. Mus., vol. 33, 1907,
 p. 245 (Zamboanga). $\frac{1}{3}$ Kendall and

Goldsbrough, Mem. Mus. Comp. Zool.,
 vol. 26, 1911, p. 292 (Suva, Fiji). $\frac{1}{2}$

Barnard, Ann. South African Mus., vol.
 21, pt. 2, 1927, p. 584, pl. 24, fig. 1
 (Katal coast and Delagoa Bay in 40
 fathoms).

Hypeneus vittatus Cantor, Journ. Asiatic
 Soc. Bengal, vol. 18, pt. 2, 1849, p. 1017
 (Pinang).

Pteraclis velifer Günther; Cat. Fish.
 Brit. Mus., vol. 2, p. 411, 1860
 (compiled). — Lutken, Køn. Danske
 Vidensk. Selsk. Skrift, Kjöbenhavn,
 vol. 12, no. 6, p. 502, pl. 4, fig. 3, 1880
 (Atlantic in lat. 23° – 24° N.) (young).

— Goode and Bean, Oceanic Ichth.,
 p. 212, 1895 (reference).

Whitley, Rec. Austral. Mus., vol. 18, no. 4, p. 146,

June 29, 1931 (compiled). — Ogilby, Rec. Austral. Mus., vol. 2, p. 65, Sep. 1893 (New Zealand).

— Jordan, Ann. Carnegie Mus., vol. 12,
 p. 332, pl. 55 (copied), 1919.

Pteraclis velifera Barnard, Ann.

South African Mus., vol. 21, pt. 2, p. 598,

Oct. 1927 (St. Helena Bay). — Phillips,

Proc. Journ. Pan Pacific Res. Inst., vol. 2, p. 73, 1927
 (New Zealand).

Oligopodus veliferus Lacépède,

Hist. Nat. Poiss., vol. 2, pp. 511, 512,

1800 ("mer des Indes").

Upeneoides vittatus Günther, Cat.

Fishes Brit. Mus., vol. 1, 1859, p. 397

(Philippines, Ceylon, Amboyna, India).

$\frac{1}{m}$ Day, Fishes of Malabar, 1865, p. 27. ✓

Fishes of India, pt. 1, 1875, p. 120, pl.

30, fig. 2. $\frac{1}{m}$ Martens, Preuss. Exped. Ost

Asien, 1876, p. 387 (Amboyna). $\frac{1}{m}$ Macleay,

Proc. Linn. Soc. New South Wales, vol. 5,

1881, p. 402 (Endeavour River, Queensland).

$\frac{1}{m}$ Károli, Termesz. Füzetek, Budapest,

vol. 5, 1881, p. 156 (Singapore). $\frac{1}{m}$ Meyer,

An. Soc. Españ. Hist. Nat. Madrid, vol.

14, 1885, p. 15 (North Celebes; ^{Kodo,} Mysore, India).

$\frac{1}{2}$ Day, Fauna British India, Fishes,

vol. 2, 1889, p. 25, fig. 10. $\frac{1}{m}$ Sauvage, Hist.

Nat. Madagascar, Poiss., 1891, p. 279 (not

27, fig. 2) (Mauritius, Pondicherry, Batjan,

Celebes, Amboyna, Borabora, New Guinea,

Tahiti). $\frac{1}{m}$ Elera, Cat. Fauna Filipinas,

vol. 1, 1895, p. 479 (Luzon, Manila Bay,

Pteraclis guttatus Valenciennes,
Hist. nat. Poiss., vol. 9, p. 370, 1833
(on Pallas).

Pteraclis pinnata Gray, Cat. Fish
Gronow, p. 170, 1854 (type locality,
"Oceano Indico").

Pteraclis (Bentonia) sp. Whitley,
Rec. Austral. Mus., vol. 18, no. 4, p. 146,
June 29, 1931 (New Zealand).

Batangas, Pangasinan) $\frac{1}{m}$ Jordan and
 and Evermann, Proc. U. S. Nat. Mus., vol.
 25, 1902, p. 335 (Keerun, Formosa). $\frac{1}{m}$
 $\frac{1}{m}$ Gilchrist and Thompson, Ann. South
 African Mus., vol. 6, 1908-11, p. 163
 Durban). $\frac{1}{m}$ Jordan and Richardson,
 Mem. Carnegie Mus., vol. 4, no. 4, Aug. 28,
 1909, p. 193 (Keerun record). $\frac{1}{m}$ Seale,
 Philippine Journ. Sci., vol. 5, no. 4, 1910,
 p. 278 (Sandakan, Borneo). $\frac{1}{m}$ Jugmayer,
 Abhandl. Kon. Bayer. Akad. Wiss.,
 Math.-physik. Klasse, vol. 26, band 6,
 1913, p. 11 (Mekran). $\frac{1}{m}$ Gilchrist and
Thompson, Ann. Durban Mus., vol. 1, pt.
 4, 1917, p. 365 (references). $\frac{1}{m}$ Fowler,
~~Proc. Acad. Nat. Sci. Philadelphia, 1925,~~
~~p. 246 (Delagoa Bay).~~ $\frac{1}{m}$ Jordan and
Hubbs, Mem. Carnegie Mus., vol. 10, no. 2,
 June 27, 1925, p. 245 (Kagoshima Bay).
 $\frac{1}{m}$ Fowler and Bean, Proc. U. S. Nat.

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Depth (without fin sheaths) $4\frac{1}{2}$;
head 5. Eye 4 in head, little
larger than snout; maxillary
reaches below hind pupil edge;
teeth uniserial in jaws, 4 or 5
in single row on each palatine,
2 in longitudinal line on vomer.
Lower gill rakers 6, wide spaced,
spinules on inner edges, smaller
one just above bend.

Scales in lateral series 50,
transversely 16 or 17 (without fin
sheaths). Scales behind pectoral
arch each with hooked, backwardly
directed spine. Head, except
snout and lower jaw, scaly.

D. L.V., begins space from
premaxillary symphysis equal to
 $\frac{1}{3}$ eye diameter, first spine very
short, then spines longer to fourth
which equals eye; A. L.

Traces of silver on body,

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dorsal and anal fins blackish.
Length 520 mm. (Barnard.)

Indian Ocean. Bonnaterre's figure shows the orbit equal to the supraorbital height, dorsal fin height $2\frac{1}{8}$ in fish without caudal, anal fin height $1\frac{3}{4}$, and pectoral and caudal each long as head. Both dorsal and anal are dark with innumerable small, irregular pale or whitish spots.

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Pteraclis aesticola Jordan and Snyder

Bentenia aesticola Jordan and Snyder,
Journ. College Sci. Univ. Tokyo, vol.
15, pt. 2, p. 306, ^{pl. 16, fig. 6,} May 20, 1901 (type
locality, Kashima, near Mito,
Hitachi). — Jordan, Tanaka, Snyder,
Journ. College Sci. Tokyo, vol. 38,
p. 133, 1933 (reference).
— Jordan, Ann. Carnegie Mus., vol. 12,
nos. 2-4, p. 333, pl. 56, Dec. 15, 1919
(restored figure).

1327

12152. Manila market. March 12, 1908.
Length 135 mm.

19729. Tacloban market. July 25, 1909.
Length 100 mm.

Depth $3 \frac{3}{4}$; head 5. Snout $3 \frac{1}{4}$ in head; eye $3 \frac{7}{8}$, $1 \frac{1}{8}$ in snout, 1 in supraorbital height; maxillary reaches $\frac{2}{5}$ in eye, length $2 \frac{1}{8}$ in head; teeth in narrow bands, fine, sharp, equal, similar on vomer and palatines; nostrils well separated. Gill rakers 1 + 6, slender, small, far apart.

Scales 49 in median lateral series, 12? transversely. Scales hard, firm, longitudinally striate, with oblique, angular, posterior edges; on lower parts of body each with vertically compressed median spine. Scales along dorsal and anal bases enlarged, papery, form deep sheathed groove for each fin which may be completely concealed. Lateral line ill defined streak.

D. I. V., origin at end of snout,

first ray very short and graduated ^{rays} to fourth, fifth enlarged and thick, fin height $1\frac{1}{5}$ in fish without caudal; A. XI, origin opposite hind eye edge, fin height $1\frac{1}{3}$; caudal $1\frac{1}{4}$ in head; least depth of caudal peduncle $5\frac{1}{5}$; pectoral $1\frac{1}{8}$ times head, rays shown as 15; ventral minute; jugular, 5 in eye, rays probably 6?

metallic, lustrous silvery. Fins all black. Length 458 mm. (Jordan and Snyder)

Japan.

Genus Pterycombus Friés

Pterycombus Friés, Kon. Svensk.
Vet. Akad. Händl. Stockholm,
(1837) p. 14, (Type Pterycombus
brama Friés, monotypic.)

Centropholis Hilgendorfs, Sitzs.
Ber. Naturf. Freund. Berlin,
p. 1, 1878. (Type Centropholis
petersi Hilgendorfs, monotypic.)

membranes. Scales with 5 basal radiating striae; 74 to 92 slender apical denticles, with 5 to 10 transverse series of basal elements; circuli very fine.

D. VII - I, 8, I, first spine 1 to 1¹/₅ in head, first ray 1³/₅ to 1³/₄; A. I, 6, I, first branched ray 1³/₄ to 1⁷/₈; caudal 1, deeply forked, lobes pointed; least depth of caudal peduncle 2¹/₅ to 2²/₅; pectoral 1¹/₃ to 1²/₅; ventral 1¹/₄ to 1¹/₃.

Back and head above olive brown, sides lighter olivaceous and under surfaces whitish. All upper surfaces more or less obscurely mottled or clouded with darker to dusky. Obscure dark lateral axial band from eye to caudal base medially, crossing above lateral line at beginning of caudal peduncle. In young dark band

Body deeply ovoid, greatly compressed. Head moderate. Snout short, rather obtuse. Eye very large, nearly half of head. Mouth large, lower jaw well protruded. Maxillary reaches well below eye. Teeth fine, pointed, curve inward in partly regular and irregular rows in jaws, none on palate. Preopercle denticulate in young, entire with age. Branchiostegals 7. Scales cycloid, moderate. Row of 50 to 53 high basal scales along dorsal and 40 along anal base, forming deep sheaths in which scaleless fins depressible. Dorsal begins at occiput, fin ^{high in young} much lower than body ^{with age}. Anal begins

behind pectoral origin.
Ventral thoracic, with spine
and 5 rays.

Analysis of Species

a. Centropholis. Dorsal and anal spines greatly elevated, nearly half length of fish without caudal; dorsal spines 44 to 51, anal 39 to 41.

b.¹ Head $2\frac{7}{8}$; eye $3\frac{1}{8}$ in head; dorsal spines 44, begins over hind eye edge, anal 39. goodii.

b.² Head 4 to $4\frac{1}{4}$; eye 3 in head.

c.¹ Dorsal spines 50, begins over last fourth of eye. petersii.

c.² Dorsal spines 49, begins over hind eye edge. falcatus.

b.³ Head 5; eye $2\frac{1}{2}$ in head; dorsal begins over hind eye edge; anal spines 41. ledanoisi.

a.² Pterycombus. Dorsal and anal spines lower, $2\frac{1}{2}$ to 3 in fish without caudal; dorsal spines 42 to 44, anal 37 to 40. brama.

~~Pterycombus~~

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Pteraclis goodii (Jordan)

~~Centropholis~~

Pteraclis goodii Jordan, Ann.

Carnegie Mus., vol. 12, nos. 2-4,

p. 332 (342), pl. 58, lower figure

(copied), Dec. 15, 1919 (on Goode

and Bean). — Jordan, Evermann,

Clark, Rep. U.S. Comm. Fisher.,

pt. 2, p. 266, 1930 (reference).

5 examples. Basiput, Mindanao. August 1, 1909. Length 15 to 35 mm.

1 example. San Miguel Harbor, Ticao Island. April 2, 1908. Length 29 mm.

1 example. San Pascual, Burias Island. March 8, 1909. Length 27 mm.

1 example. Santa Cruz Island, Marinduque. April 24, 1908. Length 36 mm.

1 example. Tilig, Lubang. July 14, 1908. Length 36 mm.

D. 5595. Zamboanga. October 7, 1909. Length 13 to 14 mm.

[2083.] Powati Harbor, Makyan Island. November 28, 1909. Length 43 mm.

Pteraclis carolinus (not Valenciennes)
Goode and Bean, Oceanic Ichth.,
p. 212, pl. 59, fig. 218, 1895 (Lat. 28°
 $40'00''$ N., long. $78^{\circ}46'00''$, in 504 fathoms).

— Jordan and Evermann, Bull. U. S.
Nat. Mus., no. 47, pt. 1, p. 956, 1896
(above specimen).

1 example. Tomahua Island. December
11, 1909. Length 16 mm.

50639 U.S.N.M. Honolulu, Hawaiian
Islands. Bureau of Fisheries.
Length 37 mm. Type of Apogonichthys
waikiki.

51734 U.S.N.M. Upia, Samoa.
Bureau of Fisheries.
Length 30 mm. Type of Foa variolae.

51735 U.S.N.M. Upia, Samoa.
Bureau of Fisheries.
Length 32 mm. Type of Foa fo.

Depth $2\frac{1}{3}$; head $2\frac{7}{8}$, width $1\frac{2}{5}$.
 Snout $4\frac{1}{4}$ in head from snout tip; eye $3\frac{1}{8}$, greater than snout or interorbital; maxillary reaches $\frac{2}{5}$ in eye, expansion $2\frac{2}{5}$ in eye, length $1\frac{4}{5}$ in head from snout tip; teeth curved, conic, biserial, outer row little larger, especially below; no teeth on palate or on tongue; interorbital 4, low, little convex. Gill rakers $0 + 7$, lanceolate, equal gill filaments, which 2 in eye.

Scales $48 + 6$ in median lateral series, 15 series transversely behind gill opening, 6 series transversely at caudal peduncle. Head largely finely scaly, though upper surfaces of snout and interorbital

naked. Broad scaly sheath,
one scale deep of large scales,
along bases of dorsal and
anal. Each scale of longitud-
inal body series with short
spine, forming horizontal
rows of spines.

D. ~~44~~^{44, IV}, tenth ray highest or
 $1\frac{4}{5}$ in fish without caudal;
~~5~~⁵ ~~XXXXXX~~
A. ~~29~~²⁹, seventh ray $2\frac{2}{5}$; caudal
little emarginate behind, $1\frac{1}{3}$ in
total head; least depth of
caudal peduncle $4\frac{1}{4}$; pectoral
 $1\frac{2}{5}$, rays I, 14; ventral rays
I, 5, fin $2\frac{1}{2}$ in total head.

Very light or pale brown
generally, glossed with silvery
white. Iris white. Dorsal &
anal blackish, rays paler.
Caudal and paired fins all pale
or whitish.

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Gulf Stream, off South Carolina.

U. S. N. M., No. 37861. N. Lat. $28^{\circ}40'$
W. Long. $78^{\circ}46'$. Albatross Collection.
Length 58 mm. Type of Centropholis
goddei.

Elpeneoides Delague.

53176 and 53177 A.N.S.P. Bombay, India.

Prof. F. Hallberg¹⁹²⁴, Length 154 to 165 mm.

52781 to 52786 A.N.S.P. Orion, Luzon.

May 11, 1923. Rev. Joseph Clemens. Purchased.
Length 105 to 140 mm.

52787 A.N.S.P. Orion. May 9, 1923.
Rev. Joseph Clemens. Purchased. Length 141 mm.

52788 and 52789 A.N.S.P. Orani, Luzon.^{May 11, 1923.}
Rev. Joseph Clemens. Purchased. Length 122 to
127 mm.

52790 to 52795 A.N.S.P. Santa Maria,
Luzon. January 26, 1923. Rev. Joseph Clemens.
Purchased. Length 92 to 113 mm.

52796 and 52797 A.N.S.P. Santa Maria.
January 28, 1923. Rev. Joseph Clemens. Purchased.
Length 107 or 108 mm.

53000 A.N.S.P. Delagoa Bay, Portuguese
East Africa. July 1923. H.W. Bell Marley.
Length 120 mm. This Elpeneoides vittatus.

753

Pterycombus petersi (Hilgendorf)

Centropholis petersi Hilgendorf,
Sitzb. Ber. Naturf. Freund. Berlin,
p. 1, 1898 (type locality, Japanese
Sea). — Jordan, Tanaka, Snyder,
Journ. College Sci. Tokyo, vol. 33,
art. 1, p. 133, 1913 (reference).

Eye moderately large. Mouth cleft
subvertical. No teeth on palate. Branchiostegals
5.
Scales 49 in lateral series. D. 50,
fourteenth to sixteenth rays long;
A. 40, fourth ray long.
(Hilgendorf.)

A doubtful species, very
imperfectly described with the
dorsal origin said to be behind the
eye.

Genus Mionorus Krefft.

Mionorus Krefft, Proc. Zool. Soc. London,
1867, p. 942. Type Mionorus lunatus
Krefft. monotypic.

~~Apogon Jordan, Copeia, no. 44, May 24,
1917, p. 46. Type Apogon gracilis Günther.
Monotypic.~~

Eye less than snout, equals interorbital.
Mouth cleft oblique. Teeth all villiform,
without canines, on vomer and palatines,
tongue smooth. Preopercle ridge and edge
entire. Opercle with spine. Branchiostegals
7. Scales moderate, 30 in lateral line.
Two dorsals, first with 6 spines, second
with spine and 9 rays. Anal with 2
spines and 8 or 9 rays. Caudal truncate.

754

Pterycombus falcatus Barnard

Pterycombus falcatus Barnard,
Ann. South African Mus., vol. 21,
pt. 4, p. 599, pl. 25, fig. 1, Oct. 1927
(type locality, Cape Seas, exact
locality lost, but very probably
cast ashore in Table Bay).

4523. Manila market. December 12, 1907. Length 113 mm. Body silvery, with lines of zig-zag stripes. First dorsal white, with black spot. Second dorsal with several irregular lines of spots. Caudal dusky posteriorly. Anal plain pale yellow. Pectoral dirty white. Ventral yellowish.

1726 [D. 5208]. Taratara Island, S. 53° W., 1.8 miles ($11^{\circ} 45' 25''$ N., $124^{\circ} 18' 05''$ E.), off western Samar. In 20 fathoms. April 14, 1908. Length 115 mm.

Depth $2\frac{1}{2}$; head $4\frac{1}{4}$. Snout 5 in head from snout tip; eye 3, greater than snout, slightly greater than interorbital; maxillary reaches $\frac{1}{2}$ in eye, expansion 2 in eye, length 2 in head from snout tip; interorbital slopes up steeply behind. Gill rakers 1 + 7, inner edges with spinules.

Scales 48 in median lateral series to caudal base; 20 transversely behind pectoral, most scales with hooked spine directed backward, except on hind part of body and caudal peduncle, change of direction occurring at level of 43rd dorsal spine; 4 rows of spiniferous scales each side of caudal peduncle. Head, except snout, interorbital, supraorbital, front part of preorbital, lower jaw and angle

of preopercle scaly. Vertical
fins scaleless.

D. XLIX, begins above hind
edge of eye, front spines very
short gradually increase in
length to eighth which equals
eye, twelfth to fourteenth $\frac{2}{3}$
of body; A. XLI, begins below
scaly pectoral base, first
spine very short, graduated to
third, fifth and sixth abruptly
longer or equal longest dorsal
spines; caudal long as head,
well forked; least depth of
caudal peduncle 4; pectoral
1, rays 20, upper 2 rays spine
like, stouter than others; ventral
inserted little before dorsal
origin, slightly longer than eye.
Uniform bright silver, fins pale
horn color, tips and margins of dorsal
and anal brownish. Iris silver.
Length 300 mm. (Barnard.)
South Africa.

757

Pterycombus ledaensis (Belloc)

Centropholis ledaensis Belloc, no. 5,
Bull. Mus. Hist. Nat. Paris, vol. 32,
fig. (poor) p. 271, 1926 (type locality, "bord du banc
de la Grand Sole, lat. $49^{\circ}53'N.$, in 360 meters;
parages du cap Bojador").
— Barnard, Ann. South African
Mus., vol. 21, pt. 2, p. 600, Oct. 1927
(note).

Mionorus mydrus Jordan and Seale.

Mionorus mydrus Jordan and Seale, Proc.
U. S. Nat. Mus., vol. 28, 1905, p. 778, fig. 4.
Regan; Bull. Bur. Fisher., vol. 26, 1906
(1907), p. 17 (Manila).

Depth $2\frac{1}{2}$; head $2\frac{1}{4}$, width $2\frac{1}{2}$.
Snout $5\frac{2}{3}$ in head from snout tip; eye
 $2\frac{2}{3}$ in head, greater than snout,
subequal with interorbital; maxillary
reaches opposite eye center, expansion
3 in eye, length $2\frac{1}{5}$ in head from
snout tip; teeth minute, uniform,
in narrow bands in jaws, on vomer
and palatines; interorbital $2\frac{1}{3}$, little
convex; preopercle edge and ridge
entire. Gill rakers $4? + 12$,
lanceolate, longer than gill filaments
or about $\frac{2}{3}$ of eye.

Scales 24 in lateral line to
caudal base and 2 more on latter,

Depth 2; head $3\frac{1}{2}$. Eye 5 in head, greater than snout; maxillary reaches $\frac{1}{3}$ in eye, expansion 2 in eye, length $1\frac{1}{2}$ in head; teeth cardiform, fine, pointed, recurved, biserial, none on palate; interorbital moderately high.

Scales 51 in lateral line, 17 or 18 transversely.

D. I, I, begins behind eye, depressible in 2 rows of basal scales; A. XII, like dorsal, origin behind pectoral base; pectoral rays 20, slightly longer than head; ventral rays I, 5, equals eye; caudal emarginate.

Silvery gray. Vertical fins black. Pectoral gray yellow. Length not given. (Belloc.) Eastern Atlantic.

759

Pterycombus brama Fries

Pterycombus brama Fries, Kon.
Svensk. Vet. Akad. Handl.
Stockholm, 1837, p. 15, pl. 2
(type locality, Ishafvet). —
Lütken, Kon. Danske Vidensk.
Selsk. Skrift. Kjöbenhavn, ser. 5,
vol. 12, no. 6, p. 501, pl. 4, fig. 4, 1880
^{(between Africa and South America;}
^(Finnmarken; Bergen). — Smitt,
Scandinavia Fishes, vol. 1, p. 73, fig.
21, 1892 (Norway records). —
Jordan, Ann. Carnegie Mus., vol.
12, nos. 2-4, p. 331, pl. 57, upper
figure, Dec. 15, 1919 (copied).

1278

$1\frac{3}{5}$ to $1\frac{4}{5}$ in eye, length $2\frac{2}{5}$ to $2\frac{1}{2}$ in head; barbels reach opposite or slightly beyond preopercle edge, length $1\frac{1}{2}$ to $1\frac{3}{5}$ in head; teeth finely villiform, in narrow bands in jaws of 3 or 4 irregular series; very narrow band of fine villiform teeth on each palatine, sometimes few on vomer, though often obsolete or absent in young; interorbital $3\frac{1}{4}$ to 4, broadly convex; preopercle edge entire. Gill rakers $5+14$, lanceolate, $1\frac{2}{5}$ in gill filaments, which $1\frac{1}{4}$ in eye; 2 upper and 6 lower rudimentary.

Scales 32 or 33 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 below, 14 to 16 predorsal forward to snout tip; 3 rows on cheek. Scales of lateral line arborescent. Soft dorsal and anal scaly on anterior

Depth $1\frac{7}{8}$; head $3\frac{1}{4}$. Snout $4\frac{1}{6}$ in head from upper jaw tip; orbit $2\frac{2}{5}$; maxillary reaches $\frac{1}{2}$ in eye, length $1\frac{3}{4}$ in head from snout tip; teeth fine, pointed, curve inward in partly regular and irregular rows, and lower biserial with inner row little larger, especially forward; palate and tongue without teeth; interorbital convexly elevated.

Scales 49 to 51 in median lateral series, 20 transversely (without basal fin sheaths). Head scaly, except snout, premaxillary, opercle flange and mandible. Caudal mostly scaled.

D. IX, XLII to XLIV, origin above hind orbital edge, further back in young, longest rays $\frac{3}{5}$ body depth; A. III, XXXVII to XL, longest rays $\frac{3}{4}$ body depth; caudal deeply

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forked, long as head without
mandible; least depth of caudal
peduncle 4 in head; pectoral 1;
ventral $3\frac{3}{4}$, inserted before pectoral
origin.

Silvery white, somewhat darker
on back, with dorsal; anal and
ventral blackish and pectoral
light yellow. Length 384 mm.
(Smith.)

North Atlantic.